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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/615,956	07/10/2003	Byung-Kyu Lee	030681-529	1062
21839	7590	02/02/2005	EXAMINER	
BURNS DOANE SWECKER & MATHIS L L P			BERNATZ, KEVIN M	
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ALEXANDRIA, VA 22313-1404			1773	

DATE MAILED: 02/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

#2

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/615,956	LEE ET AL.	
<b>Examiner</b>	<b>Art Unit</b>	Kevin M Bernatz	1773

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM  
 THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) Responsive to communication(s) filed on \_\_\_\_.
- 2a) This action is **FINAL**.                            2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 3-7,11,12,14-16 and 32 is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_ is/are allowed.
- 6) Claim(s) 1,2,8-10,13 and 17-31 is/are rejected.
- 7) Claim(s) \_\_\_\_ is/are objected to.
- 8) Claim(s) 1-32 are subject to restriction and/or election requirement.

**Application Papers**

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date ____.	6) <input type="checkbox"/> Other: ____

**DETAILED ACTION**

***Election/Restrictions***

1. Applicant's election of the 6 species in the reply filed on December 15, 2004 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). The requirement is still deemed proper and is therefore made FINAL.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1, 2, 8 – 10, 13, 17, 19, 20 and 29 – 31 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for specific materials of the magnetic layers capable of meeting the claimed functional/intended use limitations, does not reasonably provide enablement for any conceivable combination of magnetic layers either presently existing or which might be discovered in the future and which would impart the desired characteristics. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims since the scope of the claims covers materials both existing and not yet discovered, and hence clearly not

disclosed in applicants' as-filed specification with sufficient specificity to support a position of enablement for the full breadth of the present claims.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1, 2, 8 – 10, 13 and 17 – 31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard claims 1, 2, 8 – 10, 13 and 17 – 31 and the limitation(s) "formed of materials that compensate the different physical/magnetic properties" and the corresponding elements exemplified in the Markush group of claim 2, the Examiner notes that limitations which merely recite what a product will do, rather than what they are, have been held to be indefinite and/or provide little or no weight in determination of patentability over the prior art since these limitations are not further limiting in so far as the structure of the product is concerned (*Ex parte Slob*, 157 USPQ 172, 1968). For purposes of evaluating the prior art, the Examiner has interpreted these claims to merely require the magnetic alloys of claim 18 to meet the claimed functional/intended use limitations.

Regarding claims 1, 2, 8 and 17, the terms "compensate", "improving", "reducing", "increasing", "improve", "reduce", "weak" and "strong" are relative terms which render the claims indefinite. The above terms are not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one

of ordinary skill in the art would not be reasonably apprised of the scope of the invention. For purposes of evaluating the prior art, the Examiner has interpreted any magnetic alloy as capable of meeting the limitations "compensate", "improving", "reducing", "increasing", "improve" and "reduce". Regarding claim 17, the Examiner has interpreted this claim as if it recited that one of the first or second perpendicular magnetic layers possessed a weaker exchange coupling between magnetic particles as compared with the other of the first or second perpendicular magnetic layers.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 18 recites the broad recitation "an Fe alloy, a Co alloy, a Ni alloy, a Pd alloy, a Pt alloy", and the claim also recites "CoCr alloy, a NiFe alloy, a FePt alloy" which is the narrower statement of the

range/limitation. For purposes of evaluating the prior art, the Examiner has required that only the broad recitation must be met to meet the claimed limitations.

Regarding claim 31, the limitation “have lattice matching structures” is indefinite since it is unclear as to what the structures are matching to. I.e. do the layers have lattice matching structures to each other? What degree of lattice matching? Etc. For purposes of evaluating the prior art, the Examiner deems that any two magnetic layers in the same recording medium necessarily “have lattice matching structures”, since the two layers are used together.

#### ***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

- (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
- (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
- (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1, 2, 8 – 10, 13, 17 – 20 and 28 – 31 are rejected under 35 U.S.C. 102(a), (b), and/or (e) as being anticipated by Kikitsu et al. (U.S. Patent App. No. 2001/0051287 A1).

Regarding claim 1, 2 and 8, Kikitsu et al. disclose a perpendicular magnetic recording medium comprising at least a first and a second perpendicular magnetic recording layer, and a substrate supporting the first and second perpendicular magnetic recording layers, wherein the first and the second perpendicular recording layers have different physical/magnetic properties and are formed of materials that compensate the different physical/magnetic properties (*Example 13*). Regarding the properties listed in claims 2 and 8, the Examiner notes that these limitations are met since Kikitsu et al. disclose using different magnetic materials for the layers and the Examiner notes that all magnetic layers can be used to meet applicants' claimed functional/intended use limitations.

Regarding claims 9, 10, 13, 17, 18 and 28 - 31, Kikitsu et al. disclose magnetic layers meeting applicants' claimed limitations (*Paragraph 0085 and Example 13*).

Regarding claims 19 and 20, Kikitsu et al. disclose underlayers meeting applicants' claimed limitations (*Example 13*).

8. Claims 1, 2, 8 – 10, 13, 17 – 20, 22 – 25 and 27 – 31 are rejected under 35 U.S.C. 102(a) and/or (e) as being anticipated by Ikeda et al. (U.S. Patent No. 6,468,670 B1).

Regarding claims 1, 2 and 8, Ikeda et al. disclose a perpendicular magnetic recording medium comprising at least a first and a second perpendicular magnetic recording layer (*Figure 1, CoCr Granular Layer and Co/Pt Multilayer*), and a substrate supporting the first and second perpendicular magnetic recording layers (*Figure 1*),

wherein the first and the second perpendicular recording layers have different physical/magnetic properties and are formed of materials that compensate the different physical/magnetic properties (*col. 3, lines 6 - 20*). Regarding the properties listed in claims 2 and 8, the Examiner notes that these limitations are met since Ikeda et al. disclose using different magnetic materials for the layers and the Examiner notes that all magnetic layers can be used to meet applicants' claimed functional/intended use limitations.

Regarding claims 9, 10, 13, 17, 18 and 28 - 31, Ikeda et al. disclose magnetic layers meeting applicants' claimed limitations (*col. 3, lines 6 – 65 and col. 4, line 66 bridging col. 5, line 35*).

Regarding claims 19 and 20, Ikeda et al. disclose underlayers meeting applicants' claimed limitations (*Figure 1 and col. 3, lines 25 – 48*).

Regarding claims 22 – 25 and 27, Ikeda et al. disclose magnetic alloys meeting applicants' claimed composition limitations (*col. 4, line 66 bridging col. 5, line 20*).

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda et al. as applied above.

Ikeda et al. is relied upon as described above.

While Ikeda et al. disclose the possibility of using CoCrPt alloys for both the multilayered and granular magnetic film, Ikeda et al. fail to explicitly disclose using CoCrPt alloys having different compositions.

However, the Examiner deems that it would have been obvious to one having ordinary skill in the art to have determined the optimum value of a results effective variable such as the composition of the granular magnetic alloy film and the "continuous" thin films through routine experimentation. *In re Boesch*, 205 USPQ 215 (CCPA 1980); *In re Geisler*, 116 F. 3d 1465, 43 USPQ2d 1362, 1365 (Fed. Cir. 1997); *In re Aller*, 220 F.2d, 454, 456, 105 USPQ 233, 235 (CCPA 1955). The Examiner notes that one of ordinary skill in the art would have been motivated to use different compositions for the two types of films, since Ikeda et al. explicitly teaches optimizing the films for different properties (col. 3, lines 6 – 20).

It would, therefore, have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Ikeda et al. to use a first and second perpendicular magnetic recording layer meeting applicants' claimed limitations, since optimization of known variables is within the knowledge of one of ordinary skill in the art and Ikeda et al. explicitly teaches optimizing the compositions for different properties.

11. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda et al. as applied above, and further in view of Coffey et al. (U.S. Patent App. No. 2002/0192506 A1) and Takahashi et al. (U.S. Patent No. 6,709,768 B2).

Ikeda et al. is relied upon as described above.

Ikeda et al. fail to disclose using magnetic layers meeting applicants' claimed composition limitations.

However, the Examiner notes that "continuous" multilayered Co/Pt superlattice magnetic films are known "high anisotropy" films while the "granular" films are known to be relatively "low anisotropy", as taught by Coffey et al. (*Paragraph 0066*). Since the amount of Pt added to a magnetic layer directly impacts the anisotropy (*Takahashi et al., col. 6, lines 20 – 31*), it would have been obvious to one of ordinary skill in the art to form one of the CoPt alloy layers with a low Pt content (e.g. "10% or less") and the other CoPt alloy layer with a high Pt content (e.g. "10% or more") in order to produce magnetic layers possessing a larger difference in anisotropy, as desired in the Ikeda et al. invention.

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Ikeda et al. to meet applicants' claimed composition limitations as taught by Coffey et al. and Takahashi et al., since such a composition would result in a larger difference in the magnetic anisotropy values for the "high anisotropy" multilayer "continuous" film versus the "low anisotropy" granular film.

12. Claims 22 – 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kikitsu et al. as applied above.

Kikitsu et al. is relied upon as described above.

Regarding claims 22 – 25 and 27, Kikitsu et al. fail to explicitly disclose alloy combinations meeting applicants' claimed limitations.

However, Kikitsu et al. teach that the perpendicular magnetic films can be made from alloys meeting applicants' claimed limitations,

However, the Examiner deems that all the various magnetic layers are known equivalents for perpendicular magnetic films, as taught by Kikitsu et al. (*Paragraph 0085 and Examples*).

Substitution of equivalents requires no express motivation as long as the prior art recognizes the equivalency. In the instant case, the various magnetic alloys are all known magnetic alloys and are equivalents in the field of magnetic compositions suitable for use as perpendicular magnetic recording layers. *In re Fount* 213 USPQ 532 (CCPA 1982); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *Graver Tank & Mfg. Co. Inc. v. Linde Air Products Co.* 85 USPQ 328 (USSC 1950).

Regarding claim 26, since Kikitsu et al. disclose that the layers should be optimized for different purposes and magnetic anisotropy, it is deemed that one of ordinary skill in the art would necessarily desire to produce recording layers meeting applicants' claimed composition limitations since identical composition layers would not possess the wide difference in properties required by Kikitsu et al. (*Paragraphs 0189 – 0194 and 0219; and Examples*).

13. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kikitsu et al. as applied above, and further in view of Takahashi et al. ('768 B2).

Kikitsu et al. is relied upon as described above.

Kikitsu et al. fail to disclose using magnetic layers meeting applicants' claimed composition limitations.

However, the Examiner notes that Kikitsu et al. explicitly desires one of the magnetic layers to possess a higher magnetic anisotropy than the other magnetic layer (*Paragraph 0219 and Examples*). Since the amount of Pt added to a magnetic layer directly impacts the anisotropy (*Takahashi et al., col. 6, lines 20 – 31*), it would have been obvious to one of ordinary skill in the art to form one of the magnetic layers with a low Pt content (e.g. "10% or less") and the other magnetic layer with a high Pt content (e.g. "10% or more") in order to produce magnetic layers possessing a larger difference in anisotropy, as desired in the Kikitsu et al. invention.

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Kikitsu et al. to meet applicants' claimed composition limitations as taught by Takahashi et al., since such a composition would result in a larger difference in the magnetic anisotropy values for the "high anisotropy" multilayer "continuous" film versus the "low anisotropy" granular film.

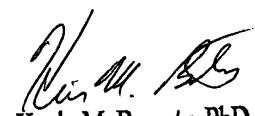
***Conclusion***

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M Bernatz whose telephone number is (571) 272-1505. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (571) 272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KMB  
January 31, 2005



Kevin M. Bernatz, PhD  
Primary Examiner